openreach

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Suppliers' Information Note

For The Openreach Network

OPENREACH WHOLESALE EXTENSION SERVICE 100 (WES 100), WHOLESALE END TO END EXTENSION SERVICES 100 (WEES100) and WHOLESALE EXTENSION SERVICE LOCAL ACCESS 100 (WES-LA 100)

Service & Interface Description

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CONTENTS

1. INTRODUCTION 3

2. SERVICE OUTLINE 3

3. WES/WEES/WES-LA 100 FEATURES 6

3.1 NETWORK LINK LOSS FORWARDING 6
3.2 USER LINK LOSS FORWARDING 6

4. CUSTOMER INTERFACE .... …........7

4.1 GENERAL 7
4.2 CONNECTOR 7

5. TRANSMISSION 9

6. POWER SUPPLY 9

6.1 GENERAL 9
6.2 INSTALLATION AND TESTING 9
6.3 AC POWER CONNECTION 9
6.4 DC POWER CONNECTION 10
6.5 ADDITIONAL DETAILS 10

7. FURTHER INFORMATION 10

8. REFERENCES 11

9. ABBREVIATIONS 11

10. HISTORY 12

Figures

Figure 1. WES 100 Service Configuration 4
Figure 2. WEES 100 Service Configuration 5
Figure 3. WES-LA 100 Service Configuration 5
Figure 4. WES/WEES/WES-LA 100 NTE RJ45 Connector Pin Out Connections 8

1. Introduction

This Suppliers' Information Note (SIN) describes the interface provided with the Openreach Wholesale Extension Services 100 (WES 100), Wholesale End to End Extension services 100 (WEES100) and Wholesale Extension Services Local Access 100 (WES-LA 100). It also provides general information on the WES/WEES 100 Services, and on some of the physical aspects of the NTE currently being deployed for new customer orders.

WES/WEES Services are high speed, point-to-point data circuits that are permanently connected and available 24 hours a day, 365 days per year. WES provides a secure link between an end user Site and the Communications Provider's (CP's) network at a CP's Site. Openreach WEES provides a secure link between an end user site and another end user site. WES-LA provides a secure link between an end user site and the serving exchange serving that site, with the circuit terminating at a CP presence at that serving exchange (in a Licensed Facility in the BT Exchange).

Any specific technology mentioned in this document is current as of today, however it may be subject to change in the future. Should the specification of the interface be changed, this will be notified by a new issue of this SIN. Openreach reserves the right to adapt technology to deliver WES/WEES services as new developments are made. All services are delivered over an uncontended transmission path.

SPECIAL NOTICE

Openreach has formally notified the withdrawal from new supply of all WES WEES BES products up and including 1Gbit/s as from 1st June 2011 along with the removal of all modify options (Bandwidth upgrade, shift, re-site & rearrange) as from 1st June 2013

Openreach have notified End of Support as from 1 April 2018 for all WES WEES BES (up to and including 1Gbits). Please refer to Openreach briefing GEN061/14 (www.openreach.co.uk)

WES WEES BES 2.5Gbit/s and 10Gbit/s will remain available along with WES Aggregation

2. Service Outline

The WES/WEES 100 service is a point-to-point data service offering high bandwidth connectivity over radial distances up to 25km between sites. This radial (or point to point) distance can result in physical line plant route distances of up to 40km. The WES-LA only provides access as far as the serving exchange and, as this is the only exchange involved, main link radial distances between exchanges are not applicable. The current interface offered i.e. the Network Terminating Equipment (NTE) will be Fast Ethernet[Error! Reference source not found.] operating at 100 Mbit/s in half or full duplex mode, with an RJ-45 physical connection. The uncontended transmission path is routed via the Openreach network. WES provides a secure link between a third party customer Site and the Communications Provider's (CP's) network at a CP's Site. WEES provides a secure link between a third party site and another third party site. WES-LA provides a secure link between an end user site and the serving exchange serving that site, with the circuit terminating at a CP site or presence at that serving exchange (a Licensed Facility in the BT Exchange).

For enquiries concerning connection availability between particular sites and for further information on the WES/WEES 100 service please contact your Openreach Sales & Relationship Manager.

A schematic of the WES 100 service is shown in Figure 1.

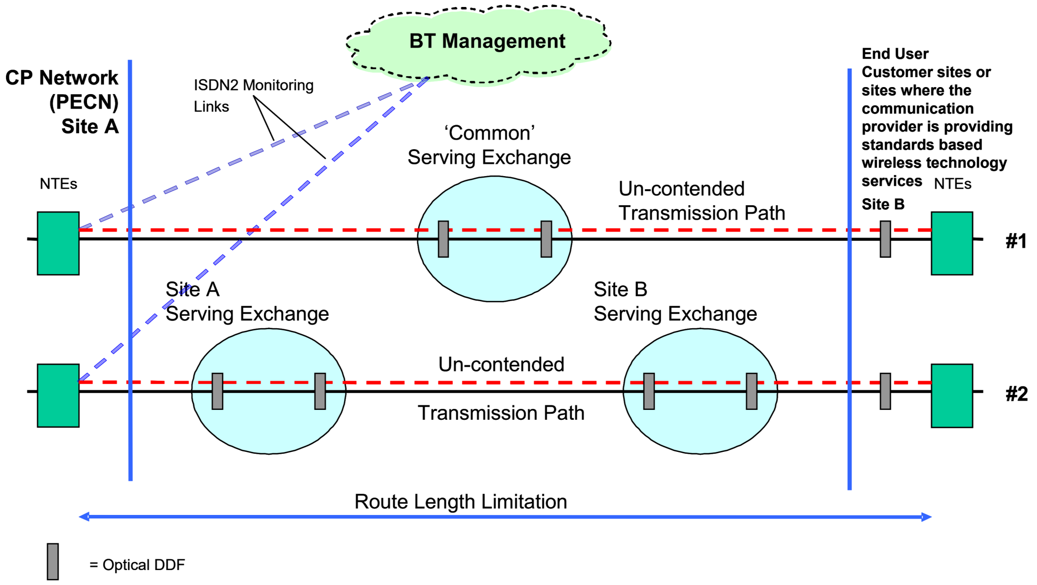
BT Management
CP Network
(PECN)
Site A
ISDN2 Monitoring
Links
NTEs
'Common'
Serving Exchange
Un-contended
Transmission Path
End User
Customer sites or
sites where the
communication
provider is providing
standards based
wireless technology
services
NTEs
Site B
#1
Site A
Serving Exchange
Site B
Serving Exchange
Un-contended
Transmission Path
#2
Route Length Limitation
= Optical DDF

Figure 1. WES 100 Service Configuration

Note1. Figure 1 depicts two separate circuit scenarios, not a combined service. The upper horizontal black line (#1 - NTE to NTE) represents a WES circuit where both ends have a common serving exchange. The lower line (#2) represents a circuit where the ends are served from different exchanges.

Note2. The service cannot be purchased as a point-to-point circuit directly connected between two 3rd party customer sites, whether or not the physical route is via a BT exchange. This diagram is using current technology / delivery, this is subject to change.

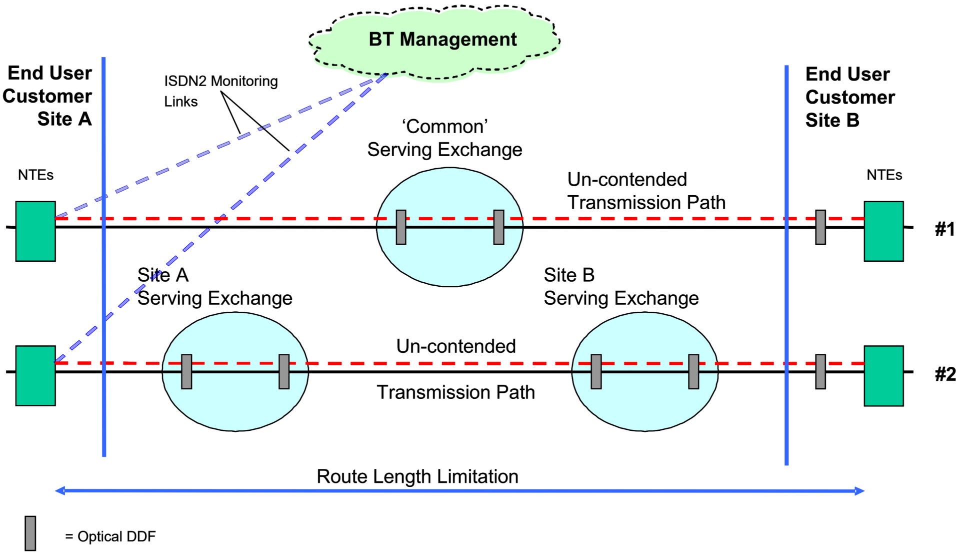
BT Management
End User
Customer
Site A
ISDN2 Monitoring
Links
'Common'
Serving Exchange
End User
Customer
Site B
NTEs
Un-contended
Transmission Path
NTEs
#1
Site A
Serving Exchange
Site B
Serving Exchange
Un-contended
Transmission Path
#2
Route Length Limitation
= Optical DDF

Figure 2. WEES 100 Service Configuration

> Note 3. Figure 2 depicts two separate circuit scenarios, not a combined service.
> The upper horizontal black line (#1 - NTE to NTE) represents a WEES circuit where both ends have a common serving exchange. The lower line (#2) represents a circuit where the ends are served from different exchanges.

In most cases WES/WEES/WES-LA 100 will be used to interconnect two Fast Ethernet LANs on physically distant sites.

The WES/WEES/WES-LA 100 service is connected for operational support purposes to the Wholesale Extension Services management platform.

A schematic of the WES-LA 100 service is shown in Figure 3.

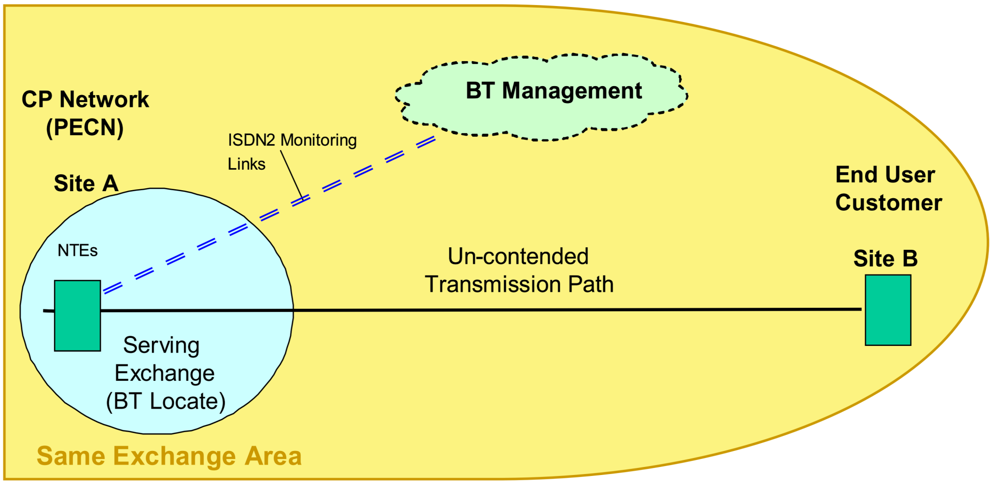
CP Network
(PECN)
BT Management
ISDN2 Monitoring
Links
Site A
End User
Customer
NTEs
Un-contended
Transmission Path
Site B
Serving
Exchange
(BT Locate)
Same Exchange Area

Figure 3. WES-LA 100 Service Configuration

3. WES/WEES/WES-LA 100 Features

This service includes the IEEE 802.1dError! Reference source not found. Bridging functionality, which allows for the Learning and Filtering of traffic packets destined for those hosts connected at the local end. Packets destined for local end MAC addresses will not be forwarded across the transmission path to the distant end, after these MAC addresses have been learnt and until the system's Cache memory has been refreshed after a host has been removed.

The Full Duplex option is in accordance with IEEE 802.3xError! Reference source not found.. The NTE is configured by Openreach to the customer's requirements of either Half or Full Duplex at time of installation.

The WES/WEES 100 NTE is capable of transmitting frame sizes from 64 bytes to a maximum of 1548 bytes. This is to maintain compatibility with a number of frame tagging formats, in particular VLAN tagging as specified in IEEE 802.1qError! Reference source not found. with 1522 byte frame size.

Note: The definition of frame lengths includes the 4 byte CRC but does not include any preamble.

Where packet-loss sensitive applications such as Voice over IP (VoIP) are carried over half-duplex network arrangements, it is recommended that the throughput should not exceed 40%, to prevent any packet loss due to collisions. This is a limitation of the Ethernet protocol in half-duplex mode and not of the WES/WEES/WES-LA 100 NTE itself.

The overall design of the customer network and the included WES/WEES circuit will need to be within the normal operating ranges and parameters of Ethernet to operate satisfactorily.

Both ends and Openreach NTE should be configured for the same mode of operation (i.e. either Half or Full Duplex).

The WES/WEES/WES-LA 100 NTE is offered with Link Loss Forwarding (LLF). Openreach enables this Link Loss Forwarding feature on installation.

3.1 Network Link Loss Forwarding

When a break is detected on the Openreach network link, the customer interface (RJ-45 port) is shut down to indicate the state of the infrastructure. This continues until such time as the network break is repaired.

3.2 User Link Loss Forwarding

User Link Loss Forwarding (U-LLF) allows the notification of failure of a customer device at one end of a WES or WEES service to be propagated to a customer device at the other end of the same service.

User Link Loss Forwarding is available as a unidirectional service for the following managed products:

- WES 100
- WES 100 Local Access
- WEES 100

The availability of User LLF is dependent on the correct level of NTE hardware and software at each end of a circuit.

User LLF is offered as a unidirectional service only. For WES it is recommended that this is between the CP's PoP and the end user customer only. This means that the WES circuit is taken down using User LLF only if problems occur at the CPs equipment at the CP PoP site end of the circuit. If problems occur at the end user customer's equipment, the circuit will not be taken down. For WEES this can be set in either direction (A to B; B to A).A bidirectional U-LLF service is not offered since it may complicate fault finding as it becomes extremely difficult for both Openreach and the Service Provider to determine whether the cause of the fault was due to end customer or CP PoP. Also by having this feature work in both directions may prevent some links from automatically re-establishing after an interruption.

4. Customer Interface

4.1 General

Fast Ethernet, or 100BaseT, is conventional Ethernet but faster, operating at 100 Mbit/s instead of 10Mbit/s. Fast Ethernet is based on the proven CSMA/CD Media Access Control (MAC) protocol and can use existing 10BaseT, Category 5 cabling. Data can move from 10 Mbit/s to 100 Mbit/s without protocol translation or changes to application and networking software. The WES/WEES/WES-LA 100 service automatically filters out local traffic, collisions and error packets.

4.2 Connector

The interface is the Network Termination Point (NTP), i.e. the point of connection on the Openreach Network Terminating Equipment (NTE) for connecting CPE or CP equipment.

The Interface consists of a RJ-45 type socket. The CP / customer provides the category 5 connecting cords between the NTE and their own equipment. The maximum cable length is 100 metres.

The RJ-45 type connector is as specified in the 100BaseT IEEE 802.3u/x[Error! Reference source not found.Error! Reference source not found.] specifications.

Attention is drawn to the Intellectual Property Rights (IPRs) set out in the preface of this agreed International standard. It is the responsibility of the supplier of CPE or CP equipment to ensure that they have the necessary rights from the owner of the IPR. The IPR owner has stated that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world.

The NTE connector socket pin outs are shown for information in Figure 4:

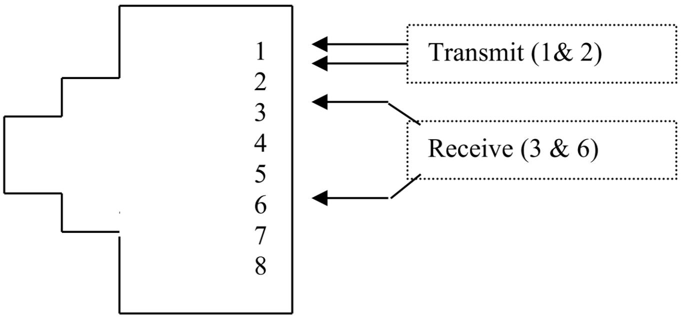
1
2
3
4
5
6
7
8
Transmit (1& 2)
Receive (3 & 6)

Figure 4. WES/WEES/WES-LA 100 NTE RJ45 Connector Pin Out Connections

5. Transmission

Fast Ethernet can maintain CSMA/CD or full duplex working as per IEEE 802.3x Error! Reference source not found.. Fast Ethernet reduces the duration of time each bit is transmitted by a factor of 10, thus enabling the packet speed to increase tenfold from 10 Mbit/s to 100 Mbit/s. Data can be passed between Ethernet and Fast Ethernet without the need for protocol translation, because Fast Ethernet also maintains the 10BaseT error control functions as well as the frame format and length.

The NTEs are connected to the Openreach provided uncontended transmission path.

6. Power supply

6.1 General

By placing a order with BT the customer has accepted the conditions placed by BT. In relation to powering of equipment, the customer must comply with the requirements of BS7671 and the details giving within the 'DC Power Planning and Installation Guide for WES-BES Products' document.

The Openreach NTE is locally powered and offers AC or DC power options. The CP will be required to provide either a local 50 Hz AC supply in the form of standard 13 Amp power socket(s); or dual -50V DC power distributions and Earth connections, with all wiring colour schemes conforming to BS7671 (IEEE Wiring Regulations). It will be the customers' responsibility to ensure that the power supply is fused and safe for Openreach to use. These should be in close proximity to the NTE installation location.

6.2 Installation and Testing

In addition to the NTE and Chassis powering requirements below, a spare 50Hz AC mains supply 13 A socket should also be provided in close proximity to the NTEs, to power BT test equipment during both initial commissioning and subsequent maintenance support activities.

6.3 AC Power Connection

AC power connection between Openreach equipment and the power socket will be made using a standard IEC320 C13-14 power lead fitted with a standard 13A plug. The NTE itself has dual power supply units internally, but only requires one AC mains supply socket.

- **For most installations:**
  This will require one mains connection for each NTE provided, and the consumption of the Openreach NTE and power unit chassis in this managed service arrangement will be no more than 30 Watts per NTE.

- **For larger installations (at Openreach discretion):**
  At Openreach's discretion, where a large number of systems of one type are being deployed, a 16-slot NTE chassis version may be deployed. This will require two mains connections for each 16 slot chassis provided. The consumption with a maximum number of 16 service cards provided will be no more than 200 Watts per chassis.

6.4 DC Power Connection

The DC In-Line (Molex) connector is specified as the standard method of connecting DC power by Openreach, and represents the "Demarcation Point" between Openreach and the customer. At their site, the customer is required to provide suitable power and earth connection up to the demarcation point, and be responsible for the supply, wiring and labelling up to the demarcation point. Openreach will not supply or install the DC distribution system as part of the standard Ethernet installation.

- **Customer-provided wiring up to the Openreach specified In-Line connector**

  Wiring, MCB isolation or fuse (i.e. C Type MCB or Cartage Fuse), must be provided by the customer, up to and including the DC in-line connector, as per BT's requirements stated within the 'DC Power Planning and Installation Guide for WES-BES Products' document with respect to;

  (i) Correctly rated MCB/Fuse; refer to the WES/WEES product handbook for correct rating
  (ii) Correct labelling of wiring and MCB/fuse positions compliant with BS 7671,
  (iii) Correct size of cable for required voltage drop at required maximum current,
  (iv) Separately fused isolatable A & B power supplies, as detailed in the 'DC Power Planning and Installation Guide for WES-BES Products' document.

  The in-line connector has a maximum current handling capability of 11A, and is not to be used for equipment requiring greater than a 11A supply (such as the Nortel Optera 5200 equipment, which require 20A feeds).

6.5 Additional Details

For further details on the provision of DC Power, see the 'DC Power Planning and Installation Guide for WES-BES Products' available on the Openreach Ethernet website.

If there is a conflict between DC power information contained in the 'DC Power Planning and Installation Guide for WES-BES Products' and the SIN document, the order of precedence shall be as follows:

(a) DC Power Planning and Installation Guide for WES-BES Products
(b) SIN

7. Further Information

For enquiries concerning connection availability between particular sites and for further information on the WES 100 service, please contact your Openreach Sales & Relationship Manager, or see http://www.openreach.co.uk/orpg/products/wes/eoiwes.do.

8. References

IEEE 802.3u	IEEE standards for Local and Metropolitan Area Networks-Supplement: Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units and Repeater for 100Mbits/s Operation, Type 100Base-T (Clauses 21-30)	1995
IEEE 802.1d	IEEE Recommendations for Bridging: Learning and Forwarding	-
IEEE 802.3x	IEEE Standards for Local and Metropolitan Area Networks: Specification for 802.3 Full Duplex	1997
IEEE 802.1q	IEEE Recommendations for Virtual LANs	1998

9. Abbreviations

100BaseT	100Mbit/s twisted pair interface defined in IEEE 802.3
10BaseT	10Mbit/s Base-band twisted pair “Ethernet/IEEE 802.3” technology
CP	Communications Provider (Providers of Electronic Communications Services)
CPE	Customer Premises Equipment
CSMA/CD	Carrier Sense Multiple Access / Collision Detection
IPR	Intellectual Property Rights
ITU-T	International Telecommunications Union For Telecommunications (formerly CCITT)
LAN	Local Area Network
LLF	Link Loss Forwarding
MAC	Media Access Control (& Hardware Device Address
Mbit/s	Mega (10^6) bits per second
MCB	Mini Circuit Breaker
NTE	Network Terminating Equipment
NTP	Network Terminating Point
SAN	Storage Area Network
SIN	Suppliers’ Information Note
SHDS	Short Haul Data Service
VLAN	Virtual Local Area network
VoIP	Voice Over Internet Protocol (application)
WES	LAN Extension Service

10. History

Issue 1.0	15 Oct 2004	First Issue
Issue 1.1	22 Oct 2004	“Customer” clarified. Figure 1 replaced. Editorial changes.
Issue 1.2	29 Sept 2006	Changes made for Equivalence of Input compliant products, including addition of WEES 100.
Issue 1.3	21 Dec 2006	Addition of WES-Local Access (WES-LA)
Issue 1.4	7 Mar 2007	Contact details in "Further Information" clause updated.
Issue 1.5	29 Oct 2007	Service description amended in accordance with updated DC power guidance
Issue 1.6	13 Oct 2008	Amended in order to add new sections on Network Link Loss Forwarding and User Link Loss Forwarding.
Issue 1.7	25 June 2009	Provided clarification on DC power requirements and Link Loss Forwarding. Also minor editorial changes.
Issue 1.8	February 2011	Amended to notify no new service will be made available
Issue 1.9	February 2013	Amended to notify no new supply of Shift, re-arrange, resite or bandwidth upgrade on all WES WEES BES (up to 1G/bit) as from 1st June 2013
Issue 1.10	February 2015	Amended to notify End of Support as from 1 April 2018 for all WES WEES BES (up to and including 1Gbits). Change SINet site references from http://www.sinet.bt.com to http://www.btplc.com/sinet/
Issue 1.11	May 2020	Change SINet site references from http://www.btplc.com/sinet/ to https://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do
Issue 1.11	September 2021	Product notified end of life. No changes required.
Issue 1.11	October 2022	Product notified end of life. No changes required.
Issue 1.11	October 2023	Product notified end of life. No changes required.
Issue 1.11	October 2025	Product notified end of life. No changes required.

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